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AN INVESTIGATION OF THE SHAVING-BRUSH INDUSTRY, WITH SPECIAL REFERENCE TO ANTHRAX.

Through Col. F. F. Russell, in charge of the Laboratory Division of the Office of the Surgeon General, United States Army, reports were received of the occurrence of anthrax among soldiers. The lesions appeared on the face, and suspicion was at once directed to shaving brushes, as there had been similar outbreaks among the British military forces, which had been traced to shaving brushes. Later, several cases of facial anthrax, undoubtedly due to shaving-brush infection, were detected among the civilian population. No cases have been reported from the Navy.

Shaving brushes used in the United States are, with unimportant exceptions, made from badger hair, horsehair, or pig's bristles. With the Russian market closed the quantity of badger hair used is negligible. The large majority of the so-called badger-hair brushes now on the market are really clever imitations made by treating white hair or bristles by secret processes.

Until the war disturbed the usual commercial channels, all or nearly all of the horsehair and pig bristles used in the United States came from Russia, China, or Japan, after having been submitted to cleaning or disinfecting processes in France or Germany. When the war started in 1914 the material began to come direct to the United States via the Pacific route. Through ignorance of the danger, or through an unwarranted confidence in certificates of disinfection that accompanied the importations, some American brush manufacturers took no pains to insure the safety of the material going into their products, though suspicion as to the safety of imported horsehair was rather general among importers and dealers.

Horsehair, which is the most frequent source of shaving-brush anthrax infection, is of both foreign and domestic origin. The largest part of that used in the manufacture of shaving brushes comes from Oriental sources—China and Siberia furnishing by far the greater portion. This imported hair is notoriously dirty, and likely to be anthrax infected. It reaches this country in wooden cases which hold usually about 125 pounds. The hair is put up in bundles known to the trade as "drafts." The drafts vary in length from about 3 or 4 inches to perhaps 15 inches, and in diameter from less than 2 inches to about 3.

These drafts are always said to have been cleaned and disinfected, but they bear no indication as to the manner or methods of treatment, and results of their use have shown that the methods employed are inadequate to sterilize the hair.

Horsehair put up by domestic dealers comes chiefly from the Argentine or is collected by hair dealers locally, principally in Chicago.

The hair is washed with soap or lye, and often with warm water, but it is not submitted to any process which may be regarded as making it safe from the anthrax viewpoint. A number of these hair-dressing establishments have been visited, the various processes seen in operation, and it is certain that they do not afford a guarantee of safety.

At present the only pig bristles coming into the American market are what are called "China" bristles. They all come from the Orient, but they do not all necessarily originate in China. These bristles are said to have been boiled before shipment from the countries in which they are prepared, but there is no assurance that this has been done. On the other hand there is no direct evidence associating them with any of the cases of anthrax due to shaving brushes.

The pig bristles come in bundles ranging from 1 to 4 inches in length and usually about 1½ inches in diameter. The manufacturer of brushes buys his hair or bristles direct from importers or through a broker or wholesaler.

The manufacture of shaving brushes is confined to about 20 establishments in the United States. The only point in the process of manufacture that needs to be mentioned is that bearing on the safety of the product. It was found that some establishments made no pretense of sterilizing hair or bristles, while others conducted the process in a very thorough manner. There were all grades between these extremes.

The treatments employed were, briefly, boiling for periods varying from half an hour up to 9 or 10 hours; steaming in streaming steam for from 1 to 8 hours; treatment in an autoclave for from 15 minutes to 3 hours; subjecting to dry heat for varying periods up to a total of 24 hours. In one establishment, in addition to boiling, the material was soaked in alcohol. The boiling was done in metal containers over a free gas flame, or by leading steam into a tank or kettle of water, or by means of coils of steam pipe carried through a tank.

After a careful survey of the industry and the performance of a few tests under conditions approaching those in manufacturing establishments it was decided that either boiling or steaming afforded a satisfactory means of treating the hair.

Thermometric tests were made and it was found that when the drafts were immersed in boiling water or exposed to steam the temperature in the center of the bundles rose rapidly, reaching that of the fluid or vapor within a few minutes.

A number of shaving brushes were secured in the open market and submitted to bacteriological examination. Some were found to be anthrax-infected, but they could not be traced to any particular manufacturer, as neither the brush nor the package in which it came bore any mark to indicate its origin. Without doubt there are now in the market many brushes which are potentially dangerous.